[Name of the Document] Specification

[Title of the Invention] Image Transfer System, Image Transferring Method, Wireless Communication Device, Imaging Device, Program and Storage Medium.

[What is claimed is:]

[Claim 1]

An image transfer system in which a wireless communication device and an imaging device having first communicating functions for realizing communication with a wireless network are connected with each other via second communicating functions provided on both of said devices, and an image stored in said imaging device is transferred onto said wireless network in accordance with an operation of said wireless communication device, characterized in that

said wireless communication device comprises:

inquiring means for making an inquiry of said imaging device which is present in a communicable range;

image list information requesting means for requesting said imaging device to which the inquiry has been successfully made for image list information;

data type determining means for determining the type of data to be received based on said image list information received from said imaging device;

data requesting means for requesting said imaging device for the data of said type thus determined;

selecting means for selecting an image designated by a user based on the data transmitted from said imaging device;

selected image requesting means for requesting said imaging device for said image thus selected; and

transmitting means for transmitting said selected image received from said imaging device onto said wireless network, and

said imaging device comprises:

inquiry responding means for responding to said inquiry;

image list information transmitting means for transmitting said image list information thus requested;

data transmitting means for transmitting the data of said type thus requested; and

image transmitting means for transmitting said image thus requested.

[Claim 2]

A wireless communication device comprising local service wireless communicating means and public service wireless communicating means, characterized in that it further comprises:

inquiring means for making an inquiry of an

imaging device which is present in a range in which communication can be realized via said local service wireless communicating means;

image list information requesting means for requesting said imaging device to which the inquiry has been successfully made for image list information;

data type determining means for determining the type of data to be received based on said image list information received from said imaging device;

data requesting means for requesting said imaging device for the data of said type thus determined;

selecting means for selecting an image designated by a user based on the data transmitted from said imaging device;

selected image requesting means for requesting said imaging device for said image thus selected; and

transmitting means for transmitting said selected image thus received from said imaging device via said public service wireless communicating means.

[Claim 3]

A wireless communication device comprising first and second wireless communicating means, wherein image data received from a communication partner by said first wireless communicating means is transmitted by said second wireless communicating

means, characterized in that it comprises:

data type determining means for determining the type of data to be received based on image list information received from said communication partner by said first wireless communicating means;

data type requesting means for requesting said communication partner for the data of said type thus determined by said first wireless communicating means;

displaying means for displaying the data transmitted from said communication partner by said first wireless communicating means;

selecting means for selecting image data designated by a user and transmitted by said second wireless communicating means based on the data thus displayed; and

image requesting means for requesting said communication partner for the image data thus selected by said first wireless communicating means.

[Claim 4]

An image transfer system in which a wireless communication device and an imaging device having first communicating functions for realizing communication with a wireless network are connected with each other via second communicating functions provided on both of said devices, and an image stored in said imaging device is transferred onto said

wireless network in accordance with an operation of said wireless communication device, characterized in that

said wireless communication device comprises:

inquiring means for making an inquiry of said imaging device which is present in a communicable range;

image list information requesting means for establishing connection with said imaging device to which the inquiry has been successfully made and requesting said imaging device for image list information;

selecting means for selecting an image designated by a user based on the data transmitted from said imaging device;

selected image requesting means for requesting said imaging device for said image thus selected; and

transmitting means for transmitting said selected image received from said imaging device onto said wireless network, and

said imaging device comprises:

inquiry responding means for responding to said inquiry;

image list information transmitting means for transmitting said image list information thus requested;

data type determining means for determining the

type of data to be transmitted based on said image list information and the image displaying capability of said wireless communication device obtained from said inquiry;

data transmitting means for transmitting the data corresponding to said type thus determined to said wireless communication device; and

image transmitting means for transmitting said image thus requested.

[Claim 5]

An imaging device which is connected with a wireless communication device to transmit an image thereto in accordance with an operation from said wireless communication device, characterized in that it comprises:

inquiry responding means for responding to an inquiry from said wireless communication device;

image list information transmitting means for transmitting image list information requested from said wireless communication device;

data type determining means for determining the type of data to be transmitted based on said image list information and the image displaying capability of said wireless communication device obtained from said inquiry;

data transmitting means for transmitting the data corresponding to the type thus determined to

said wireless communication device; and

image transmitting means for transmitting the image requested from said wireless communication device.

[Claim 6]

An image transfer system according to claim 1 or 4, wherein in said second communicating function, there is used the Bluetooth standard for local service wireless communication.

[Claim 7]

An image transfer system according to claim 1 or 4, wherein said image list information includes image information on file name, shooting date, full size, thumbnail size, resolution, compression system and the like.

[Claim 8]

An image transfer system according to claim 1 or 4, wherein in the types of data, there are included full image, thumbnail image and image file name.

[Claim 9]

An image transfer system according to claim 1 or 4, wherein said data type determining means determines the type of data based on the image list information obtained by said image list information requesting means and the image displaying capability of said wireless communication device.

[Claim 10]

An image transfer system according to claim 1 or 4, wherein said data type determining means determines the type of data based on the number of image files, the image size and the thumbnail size obtained by said image list information requesting means and the image displaying capability of said wireless communication device.

[Claim 11]

An image transferring method in which a wireless communication device and an imaging device having first communicating functions for realizing communication with a wireless network are connected with each other by second communicating functions provided on both of said devices and an image stored in said imaging device is transferred onto said wireless network in accordance with an operation of said wireless communication device, characterized in that in said wireless communication device, it comprises the steps of:

making an inquiry of said imaging device which is present in a communicable range;

requesting said imaging device to which the inquiry has been successfully made for image list information;

determining the type of data to be received based on said image list information received from

said imaging device;

requesting said imaging device for the data of the type thus determined;

selecting an image designated by a user based on the data transmitted from said imaging device;

requesting said imaging device for the image thus selected; and

transmitting said selected image thus received from said imaging device onto said wireless network, and

in said imaging device, it comprises the steps of:

responding to said inquiry;

returning the image list information thus requested;

returning the data of the type thus requested; and

returning the image thus requested.

[Claim 12]

An image transferring method in which a wireless communication device and an imaging device having first communicating functions for realizing communication with a wireless network are connected with each other by second communicating functions provided on both of said devices and an image stored in said imaging device is transferred onto said wireless network in accordance with an operation of

said wireless communication device, characterized in that in said wireless communication device, it comprises the steps of:

making an inquiry of said imaging device which is present in a communicable range;

establishing connection with said imaging device to which the inquiry has been successfully made and requesting said imaging device for image list information;

selecting an image designated by a user based on the data transmitted from said imaging device;

requesting said imaging device for the image thus selected; and

transmitting said selected image thus received from said imaging device onto said wireless network, and

in said imaging device, it comprises the steps of:

responding to said inquiry;

returning the image list information thus requested;

determining the type of data to be transmitted based on said image list information and the image displaying capability of said wireless communication device obtained from said inquiry;

transmitting the data corresponding to the type thus determined to said wireless communication

device; and

returning the image thus requested.

[Claim 13]

An image transferring method according to claim 11 or 12, wherein in said second communicating function, there is used the Bluetooth standard for local service wireless communication.

[Claim 14]

An image transferring method according to claim 11 or 12, wherein said image list information includes image information on file name, shooting date, full size, thumbnail size, resolution, compression system and the like.

[Claim 15]

An image transferring method according to claim 11 or 12, wherein in the types of data, there are included full image, thumbnail image and image file name.

[Claim 16]

An image transferring method according to claim 11 or 12, wherein at the step of determining the type of data, the type of data is determined based on the image list information obtained by said image list information requesting means and the image displaying capability of said wireless communication device.

[Claim 17]

An image transferring method according to claim

11 or 12, wherein at the step of determining the type of data, the type of data is determined based on the number of image files, the image size and the thumbnail size obtained by said image list information requesting means and the image displaying capability of said wireless communication device.

[Claim 18]

A storage medium holding a program code for realizing the image transferring method according to any one of claims 11 to 17.

[Claim 19]

A program having a program code for realizing the image transferring method according to any one of claims 11 to 17.

[Detailed Description of the Invention]

[0001]

[Technical Field to which the Invention Belongs]

The present invention relates to an image transfer system, an image transferring method, a wireless communication device, an imaging device, a program and a storage medium for realizing communication of an image or image information in local service wireless communication, for example, between an imaging device and a portable terminal.

[0002]

[Prior Art]

Recently, in association with progress of

semiconductor technology, portable terminals have been remarkably popularized. In addition, most of these portable terminals has come to realize a character mailing function and a simple Web browser function, in addition to voice communication. In consideration of further improvement of the communicating capability of a next generation portable terminal, image photographing function and photographed image communicating function are expected to become important.

[0003]

Conventionally, an attempt to digitize an image taken by a camera and to transfer the image thus digitized via a portable terminal has been promoted and the practicality thereof has been noticeably improved in association with an increase in communication speed and an increase in quality of the image taken by a digital camera.

[0004]

In fact, the performance of the digital camera has been improved with a leap and in case of printing of an image of a so-called L-size, it has become possible to take the image of high quality equal to that of the image taken by a silver salt camera (a camera using a silver salt film).

[0005]

Therefore, in consideration of time and labor

taken to photograph an image by the silver salt camera, to develop and print the image in a mini-laboratory or the like and, to digitize the image thus obtained by a scanner or the like and then to transfer the image thus digitized, it can be said that image communication by using the digital camera and the portable terminal is more efficient.

[0006]

In addition, the image communication by using the digital camera and the portable terminal as mentioned above is compatible with the directivity of the current society that demands in communication are diversified and a trend toward multimedia is promoted.

[0007]

However, under present conditions, in order to realize the image communication by using the digital camera and the portable terminal, an image photographed by the digital camera needs to be fetched into a personal computer via wire means, a memory or the like and the image thus fetched needs to be transferred by connecting together the portable terminal and the personal computer and then connecting the portable terminal and the personal computer thus connected together to a public line.

[0008]

As disclosed in Japanese Patent Application Laid-Open No. H11-008823, there has been proposed

such a method that control information, status information and image data are transmitted/received between a portable terminal and an electronic imaging device and synchronous operations of the portable terminal and the electronic imaging device are realized, thereby to manipulate the electronic imaging device by the portable terminal.

[0009]

[Problems to be Solved by the Invention]

However, the above mentioned prior art has such a problem that a user needs to carry the digital camera and the portable terminal simultaneously and in order to transfer an image photographed by the digital camera in wireless communication, the user needs to manipulate the digital camera and the portable terminal separately, which is troublesome.

[0010]

In a case that the electronic imaging device is manipulated by the portable terminal by realizing the synchronous operations of the portable terminal and the electronic imaging device as disclosed in the above mentioned Japanese Patent Application Laid-Open No. H11-008823, although the electronic imaging device can be controlled by the portable terminal, the operability is not always improved simply by making it possible to handle the control information, the status information and the image data in the

electronic imaging device by the portable terminal.

[0011]

It is apparent that the portable terminal is different from the electronic imaging device in operation information, size of a liquid crystal screen on which the image is displayed, resolution, the number and types of operation buttons and the like, so that even when the electronic imaging device is controlled by the portable terminal by using the control information and the status information of the electronic imaging device, no expected improvement in operability is attained.

[0012]

Further, in order to carry out the system disclosed in the above mentioned Japanese Patent Application Laid-Open No. H11-008823, there are needed programs for simulating all the operations of the electronic imaging device in the portable terminal and hence the amount of programs in the portable terminal is greatly increased.

[0013]

Accordingly, an object of the present invention is to provide an image transfer system, an image transferring method, a wireless communication device, an imaging device, a program and a storage medium constructed such that an image and image information stored in the imaging device are transferred from one

portable terminal to another portable terminal via local service wireless communication, and the image and image information thus transferred are displayed so as to optimally suit to the size of the liquid crystal screen and the resolution of the portable terminal, thereby making it possible to improve the operability in image selection of the portable terminal.

[0014]

[Means for Solving the Problems]

In order to attain the above mentioned object, an image transfer system according to the present is of the type in which a wireless communication device and an imaging device having first communicating functions for realizing communication with a wireless network are connected with each other via second communicating functions provided on both of these devices, and an image stored in the imaging device is transferred onto the wireless network in accordance with an operation of the wireless communication device, characterized in that the wireless communication device comprises: inquiring means for making an inquiry of the imaging device which is present in a communicable range; image list information requesting means for requesting the imaging device to which the inquiry has been successfully made for image list information; data

type determining means for determining the type of data to be received based on the image list information received from the imaging device; data requesting means for requesting the imaging device for the data of the type thus determined; selecting means for selecting an image designated by a user based on the data transmitted from the imaging device; selected image requesting means for requesting the imaging device for the image thus selected; and transmitting means for transmitting the selected image received from the imaging device onto the wireless network, and the imaging device comprises: inquiry responding means for responding to the inquiry; image list information transmitting means for transmitting the image list information thus requested; data transmitting means for transmitting the data of the type thus requested; and image transmitting means for transmitting the image thus requested.

[0015]

A wireless communication device according to the present invention is of the type comprising local service wireless communicating means and public service wireless communicating means, characterized in that it further comprises: inquiring means for making an inquiry of an imaging device which is present in a range in which communication can be

realized via the local service wireless communicating means; image list information requesting means for requesting the imaging device to which the inquiry has been successfully made for image list information; data type determining means for determining the type of data to be received based on the image list information received from the imaging device; data requesting means for requesting the imaging device for the data of the type thus determined; selecting means for selecting an image designated by a user based on the data transmitted from the imaging device; selected image requesting means for requesting the imaging device for the image thus selected; and transmitting means for transmitting the selected image thus received from the imaging device via the public service wireless communicating means.

[0016]

A wireless communication device according to the present invention is of the type comprising first and second wireless communicating means, wherein image data received from a communication partner by the first wireless communicating means is transmitted by the second wireless communicating means, characterized in that it comprises: data type determining means for determining the type of data to be received based on image list information received

from the communication partner by the first wireless communicating means; data type requesting means for requesting the communication partner for the data of the type thus determined by the first wireless communicating means; displaying means for displaying the data transmitted from the communication partner by the first wireless communicating means; selecting means for selecting image data designated by a user and transmitted by the second wireless communicating means based on the data thus displayed; and image requesting means for requesting the communication partner for the image data thus selected by the first wireless communicating means.

[0017]

An image transfer system according to the present invention is of the type in which a wireless communication device and an imaging device having first communicating functions for realizing communication with a wireless network are connected with each other via second communicating functions provided on both of these devices, and an image stored in the imaging device is transferred onto the wireless network in accordance with an operation of the wireless communication device, characterized in that the wireless communication device comprises: inquiring means for making an inquiry of the imaging device which is present in a communicable range;

image list information requesting means for establishing connection with the imaging device to which the inquiry has been successfully made and requesting the imaging device for image list information; selecting means for selecting an image designated by a user based on the data transmitted from the imaging device; selected image requesting means for requesting the imaging device for the image thus selected; and transmitting means for transmitting the selected image received from the imaging device onto the wireless network, and the imaging device comprises: inquiry responding means for responding to the inquiry; image list information transmitting means for transmitting the image list information thus requested; data type determining means for determining the type of data to be transmitted based on the image list information and the image displaying capability of the wireless communication device obtained from the inquiry; data transmitting means for transmitting the data corresponding to the type thus determined to the wireless communication device; and image transmitting means for transmitting the image thus requested.

[0018]

An imaging device according to the present invention is of the type which is connected with a

wireless communication device to transmit an image thereto in accordance with an operation from the wireless communication device, characterized in that it comprises: inquiry responding means for responding to an inquiry from the wireless communication device; image list information transmitting means for transmitting image list information requested from the wireless communication device; data type determining means for determining the type of data to be transmitted based on the image list information and the image displaying capability of the wireless communication device obtained from the inquiry; data transmitting means for transmitting the data corresponding to the type thus determined to the wireless communication device; and image transmitting means for transmitting the image requested from the wireless communication device.

[0019]

An image transferring method according to the present invention is of the type in which a wireless communication device and an imaging device having first communicating functions for realizing communication with a wireless network are connected with each other by second communicating functions provided on both of these devices and an image stored in the imaging device is transferred onto the wireless network in accordance with an operation of

the wireless communication device, characterized in that in the wireless communication device, it comprises the steps of: making an inquiry of the imaging device which is present in a communicable range; requesting the imaging device to which the inquiry has been successfully made for image list information; determining the type of data to be received based on the image list information received from the imaging device; requesting the imaging device for the data of the type thus determined; selecting an image designated by a user based on the data transmitted from the imaging device; requesting the imaging device for the image thus selected; and transmitting the selected image thus received from the imaging device onto the wireless network, and in the imaging device, it comprises the steps of: responding to the inquiry; returning the image list information thus requested; returning the data of the type thus requested; and returning the image thus requested.

[0020]

An image transferring method according to the present invention is of the type in which a wireless communication device and an imaging device having first communicating functions for realizing communication with a wireless network are connected with each other by second communicating functions

provided on both of these devices and an image stored in the imaging device is transferred onto the wireless network in accordance with an operation of the wireless communication device, characterized in that in the wireless communication device, it comprises the steps of: making an inquiry of the imaging device which is present in a communicable range; establishing connection with the imaging device to which the inquiry has been successfully made and requesting the imaging device for image list information; selecting an image designated by a user based on the data transmitted from the imaging device; requesting the imaging device for the image thus selected; and transmitting the selected image thus received from the imaging device onto the wireless network, and in the imaging device, it comprises the steps of: responding to the inquiry; returning the image list information thus requested; determining the type of data to be transmitted based on the image list information and the image displaying capability of the wireless communication device obtained from the inquiry; transmitting the data corresponding to the type thus determined to the wireless communication device; and returning the image thus requested.

[0021]

Next, embodiments of the image transfer system,

the image transferring method, the wireless communication device, the imaging device, the program and the storage medium according to the present invention will be described with reference to the accompanying drawings.

Fig. 1 is a diagram showing the general configuration of an image transfer system according to the embodiment of the present invention.

[0022]

An image device 100 and a portable terminal 300 can mutually exchange data, including commands and obtained images, using wireless spectrum diffusion communication, such as communication based on the Bluetooth standards. Similarly, an image device 500 and a portable terminal 700 can exchange data, including commands and obtained images. Further, the portable terminals 300 and 700 can communicate via a wireless public communication network 800. Further, the image devices 100 and 500 can be connected via the portable terminals 300 and 700.

[0023]

Fig. 2 is a diagram showing the external arrangement of the image device 100 and that of the portable terminal 300.

For the image device 100, a flash 48, a mode dial switch 60, shutter switches 62, 64, a single

photographing/serial photographing switch 66, a compression mode switch 68, an operation unit 70, a main switch 72, an optical finder 104, a communication unit 110, an antenna 112 and an image lens 10 are provided at appropriate locations in its housing.

[0024]

And for the portable terminal 300, a microphone 310, a loudspeaker 318, a communication unit 326, an antenna 328, a communication unit 330, an antenna 332, a display unit 360 and an operation unit 362 are provided at appropriate locations in its housing.

[0025]

Further, the image device 100 includes a slot 101, into which a recording medium 120 can be loaded. Likewise, the portable terminal 300 includes a slot 301 into which a recording medium 200 can be loaded.

[0026]

Since the external arrangement of the image device 500 and that of the portable terminal 700 are the same as those of the image device 100 and the portable terminal 300, no further explanation for them will be given. Similarly, since the internal electric arrangement of the image device 500 and that of the portable terminal 700 are the same as those of the image device 100 and the portable terminal 300, which will be described later, no further explanation

for them will be given.

[0027]

Fig. 3 is a block diagram showing the internal electric arrangement of the image device 100. The image device 100 comprises a protection unit 102, an imaging lens 10, a shutter 12, an image pickup element 14, an A/D converter 16, a timing generation circuit 18, an image processing circuit 20, a memory control circuit 22, an image display memory 24, a D/A converter 26, an image display unit 28, a memory 30, a compression/extension circuit 32, the optical finder 104, the communication unit 110, the antenna 112, a system control circuit 50, a light exposure control unit 40, a distance measuring control unit 42, a zoom control unit 44, a barrier control unit 46, a flash 48, a power source control unit 80, connectors 82, 84, a power source 86, a memory 52, a display unit 54, a non-volatile memory 56, an identification information unit 58, the mode dial switch 60, the shutter switches 62, 64, the single photographing/ serial photographing switch 66, the compression mode switch 68, the operation unit 70 and the main switch 72.

[0028]

For the image device 100 comprising the above mentioned constitutional elements, the image lens 10 is used to obtain an optical image of an object,

while adjacent to the shutter 12, which has an included aperture function, is an image element 14 that converts the optical image fetched through the image lens 10 into an analog signal and outputs the signal to an A/D converter 16 that converts it into a digital signal. The timing generation circuit 18 is adapted to supply a clock signal and a control signal to the image pickup element 14, the A/D converter 16 and the D/A converter 26 and is controlled by the memory control circuit 22 and the system control circuit 50.

[0029]

The image processing circuit 20 performs predetermined pixel interpolation and color conversion processes for the data received from the A/D converter 16 or for data obtained from a memory controller 22. The image processing circuit 20 also performs a predetermined calculating process using data on the photographed image and performs AF (Automatic Focusing) process, AE (Automatic Exposing) process and EF (Flash Pre-Light-Emitting) process of the TTL (Through-The-Lens) system for making the system control circuit 50 control the light exposure control unit 40 and the distance measuring control unit 42 based on a result of the calculation thus obtained and further performs a predetermined calculating process using the data on the

photographed image and performs AWB (Automatic White Balancing) process of the TTL system based on a result of the calculation thus obtained.

[0030]

The memory control circuit 22 controls the A/D converter 16, the timing generation circuit 18, the image processing circuit 20, the image display memory 24, the D/A converter 26, the memory and the compression/extension circuit 32.

The data output by the A/D converter is written in an image display memory 24 or a memory 30 via the image processor 20 and a memory controller 22, or is written directly via the memory controller 22.

[0031]

An image display unit 28 is constituted by, for example, a TFT liquid crystal display device (LCD) to which, via a D/A converter 26, the image data written in the image display memory 24 are transmitted for display.

[0032]

The automatic finder function can be realized by sequentially displaying the photographed image data on the image display unit 28. The image display unit 28 is capable of optionally turning on/off the display in accordance with instructions from the system control circuit 50. In a case that the display is turned off, the power consumption of the image

device 100 can be greatly reduced.

[0033]

The memory 30, for storing both a static image and an animated image that are obtained, is constituted by a volatile memory and/or a non-volatile memory, and has sufficient storage capacity to store a predetermined number of static images and animated pictures representing a predetermined period of time. In case of serial photographing and panoramic photographing for serially photographing a plurality of sheets of static images, high-speed and large volume image writing can be performed on the memory 30. The memory 30 can also be used as a working area for a system controller 50.

[0034]

The compression/extension circuit 32 is adapted to compress/extend the image data by the adaptive discrete cosine transform (ADCT) or the like and reads in the image data stored in the memory 30, performs the compression/extension process thereon and writes the image data thus processed into the memory 30.

[0035]

An exposure controller 40 controls the shutter 12 having the aperture function, and provides a flashlight adjustment function while interacting with the flash 48.

The distance measuring control unit 42 controls focusing of the imaging lens 10. The zoom control unit 44 controls zooming of the imaging lens 10. The barrier control unit 46 controls the operation of the protection unit 102 serving as a barrier. The flash 48 has AF auxiliary-light light-projecting function and flash light-adjusting function. The light exposure control unit 40 and the distance measuring control unit 42 are controlled by the TTL system. The system control circuit 50 controls the light exposure control unit 40 and the distance measuring control unit 42 based on a result of calculation of the photographed image data by the image processing circuit 20.

[0036]

Further, the system controller 50 controls the entire image device 100. And a memory 52 is used to store constants, variables and programs for the operation of the system controller 50.

The display unit 54 is constituted by a liquid crystal display, a loudspeaker or the like for displaying/informing of status of operation, message and the like using characters, images, voices and the like in response to the execution of the program by the system control circuit 50. One or a plurality of display unit(s) is/are installed in ocularly recognizable position(s) in the vicinity of the

operation unit of the image device 100. The display unit 54 is constituted by a combination of, for example, an LCD, an LED, a voicing element and the like and part of its functions is installed in the optical finder 104.

[0037]

Among display contents of the display unit 54, single shot/serial photograph display, self-timer display, compressibility factor display, recorded pixel number display, recording sheet number display, display of the number of remained sheets which can be photographed, shutter speed display, stop value display, exposure correction display, flash display, red-eye moderation display, micro-photograph display, buzzer setting display, timer battery residue display, error display, information display with numbers of a plurality of figures, display of attaching/detaching state of the recording medium 200, communication I/F operation display, date/time display and the like are displayed on the LCD and the like. Among the display contents of the display unit 54, focusing display, hand vibration warning display, flash charge display, shutter speed display, stop value display, exposure correction display and the like are displayed in the optical finder 104.

[0038]

The non-volatile memory 56 is an electrically

erasable and recordable memory and, for example, an EEPROM or the like is used as the non-volatile memory 56. Various pieces of identification information used for certification prior to communication in case of communication with the portable terminal 300 via the communication unit 110 and the antenna 112 are stored in the identification information unit 58.

[0039]

The mode dial switch 60, the shutter switches 62, 64, the single photographing/serial photographing switch 66, the compression mode switch 68, the operation unit 70 and the main switch 72 are operation units for inputting various operational instructions of the system control circuit 50 and are constituted by one or a combination of a plurality of components of a switch, a dial a touch panel, a pointing device by ocular detection, a voice recognizer and the like.

[0040]

These operation units will be specifically described. The main switch 72 can be set by turning on/off the power source. The mode dial switch 60 can be set by switching various function modes such as an automatic photographing mode, a photographing mode, a panoramic photographing mode, a reproducing mode, a multiple screen reproducing/erasing mode, a PC (personal computer) connecting mode and the like. The

shutter switch SW1 (62) turns on during the operation of a shutter button (not shown) to instruct to start the operations such as the AF (automatic focusing) process, the AE (automatic light-exposing) process, the AWB (automatic white balancing) process, the EF (flash pre-light-emitting) process and the like.

[0041]

A shutter switch 62 is set ON by manipulating a shutter button (not shown), which is also used to instruct the start of an operating sequence, such as an exposure process, based on a signal read from the image element 14, for writing image data to the memory 30 via the A/D converter 16 and the memory controller 22, a development process for employing the computations performed by the image processor 20 and the memory controller 22, a process for reading image data from the memory 30, a compression process performed by a compression/decompression circuit 32, and a recording process for writing image data on the recording medium 200.

[0042]

The single photographing/serial photographing switch 66 is capable of setting a single photographing mode in which photographing of one frame is conducted and then a standby state is taken when the shutter switch SW2 (64) is depressed and a serial photographing mode in which the photographing

is serially conducted during the shutter switch SW2 (64) is being depressed.

[0043]

The compression mode switch 68 is capable of selecting the compressibility factor of JPEG (Joint Photographic Experts Group) compression or a CCDRAW mode for directly digitizing the signal from the image pickup element 14 and recording the signal thus digitized into the recording medium.

[0044]

The operation unit 70 is constituted by various buttons and touch panels and includes a menu button, a set button, a micro button, a multiple screen reproducing/page-turning button, a flash setting button, a self timer button, a menu shift +(plus) button, a menu shift -(minus) button, a reproduced image shift +(plus) button, a reproduced image shift -(minus) button, a photographed image quality selection button, a light-exposure correction button, a date/time setting button, a reproduction switch for setting various function modes such as a reproduction mode, a minus screen reproduction/erasing mode, a PC connection mode, an AF mode setting switch for setting a one-shot AF mode in which when the shutter switch SW1 (62) is depressed, the automatic focusing operation is started, and once the focusing is established, the focusing state is maintained and a

servo AF mode in which during the shutter switch SW1 (62) is being depressed, the automatic focusing operation is continuously performed, an image display ON/OFF switch for turning on/off the image display unit 28, a quick review ON/OFF switch for setting a quick review function for automatically reproducing the photographed image data immediately after the photographing and other switches. In this connection, the values and functions of the above plus and minus buttons can be more readily selected with the provision of a rotary dial switch.

[0045]

The power source control unit 80 is constituted by a battery detection circuit, a DC-DC converter, and a switch circuit for changing over a block to be made electrically conductive, detects mounting/dismounting of a battery, the kind of the battery used, the residue in the battery, controls the DC-DC converter based on a result of detection and instructions from the system control circuit 50 and supplies required voltage to various units including the recording medium for a required period of time. The power source 86 is constituted by a primary battery such as an alkali battery or a lithium battery, a secondary battery such as an NiCd battery, an NiMH battery or an Li-ion battery or an AC adapter.

[0046]

The protection unit 102 is a barrier for preventing the imaging unit from being stained and broken by covering the imaging unit including the imaging lens 10 of the image device 100. The optical finder 104 realizes the photographing alone with no use of the electronic finder function by the image display unit 28. Within the optical finder 104, some of the functions of the display unit 54, for example, the focusing display, the hand vibration warning display, the flash charge display, the shutter speed display, the stop value display, the exposure correction display and the like are installed.

[0047]

A communication unit 110 includes various short-distance, fast data transmission functions using spectrum diffusion communication means, such as is represented by Bluetooth. An antenna 112 is used to permit the communication unit 110 to connect the image device 100 with another device.

[0048]

An interface 128 serves as an interface with a recording medium, such as a memory card or a hard disk. And a connector 127 is used as a connection with a recording medium, such as a memory card or a hard disk.

[0049]

Although, in this embodiment, a case that one

system of the interface and connector for attaching the recording medium has been described, a plurality of systems of the interfaces and connectors for attaching the recording medium may be used. In addition, interfaces and connectors of different standards may be combined with one another. Further, the interfaces and connectors conforming to the standards of PCMCIA (Personal Computer Memory Card International Association) card, CF (Compact Flash) card, MMC (Multi-Media Card) and the like may be used.

When an interface 128 and a connector 127 that conform to the PCMCIA card standards or a CF card is employed, upon the connection of a communication card, such as a LAN card, a modem card, a USB card, an IEEE (Institute of Electrical and Electronic Engineers) 1394 card, a P1284 card, a SCSI (Small Computer System Interface) card or a PHS, image data and management information belonging to the image data can be exchanged with a peripheral device, such as another computer and a printer, without having to use the communication unit 110.

[0050]

The recording medium 120 is constituted by a memory card or a hard disk, and includes a recording unit 122, which is a semiconductor memory or a magnetic disk; an interface 124 used for the image device 100; a connector 126 used for a connection

with the image device 10; and an identification information unit 129.

[0051]

Fig. 4 is a block diagram showing the internal electric structure of the portable terminal 300.

The portable terminal 300 comprises a microphone 310, a loudspeaker 318, an A/D converter 312, a D/A converter 316, a memory control circuit 314, a memory 320, a D/A converter 322, an image display unit 324, an antenna 328, a communication unit 326, an interface 390, a connector 392, an antenna 332, a communication unit 330, a communication system control circuit 350, an identification information unit 356, a power source control unit 380, connectors 382, 384, a power source 386, a memory 352, a non-volatile memory 354, a display unit 360, an operation unit 362, a call arrival notification unit 364 and a recording medium attaching/detaching detection unit 366.

[0052]

The microphone 310 is used to convert sound into an electric signal. The A/D converter 312, at the microphone 310, converts an analog signal input into a digital signal. The memory controller 314 writes the data output by the A/D converter 312 in the memory 320, and reads data from the memory 320 that it transmits to the D/A converter 316.

[0053]

The D/A converter 316 converts a digital signal into an analog signal. The loudspeaker 318 converts an electric signal into a digital signal. The memory 320 is used to store sound input at the microphone 310 and/or static or animated images that are transmitted by the image device 100. And the capacity of the memory 320 is adequate for the storage of sound released for a predetermined period of time, and/or a predetermined number of static images and animated images representing a predetermined period of time.

The D/A converter 322 converts into analog signals the static image and animated image data stored in the memory 320, and the image display unit 324 displays an image signal output by the D/A converter 322.

[0054]

A communication unit 326 includes various long-distance wireless communication functions, such as TDMA (Time Division Multiple Access), CDMA (Code Division Multiple Access), and W-CDMA (Wide-band code Division Multiple Access), while an antenna 328 permits the communication unit 326 to establish communication between the portable terminal 300 and the base station of the public communication network 800.

[0055]

A communication unit 330 includes various short-distance, fast data communication functions for spectrum diffusion communication, such as is represented by Bluetooth, while an antenna 332 permits the communication unit 330 to establish communication between the portable terminal 300 and another device.

[0056]

A communication system controller 350 controls the entire portable terminal 300. And a memory 352 is used to store constants, variables and programs for the operation of the communication system controller 350. The non-volatile memory 354 is an electrically erasable memory and as the non-volatile memory, for example, the EEPROM or the like is used.

[0057]

In the identification information unit 356, there are stored various pieces of identification information used for certification prior to communication when the communication with the image device 100 is effected via the communication unit 330 and the antenna 332. The display unit 360 is constituted by a liquid crystal display, a loudspeaker or the like for displaying/informing of operational state, message and the like by using characters, images, voices and the like in response

to the execution of a program by the communication system control circuit 350. One or a plurality of display unit(s) is/are installed in ocularly recognizable position(s) in the vicinity of the operation unit of the portable terminal 300. The display unit 360 is constituted by combining, for example, an LCD, an LED, a voicing element and the like with one another.

[0058]

An operation unit 362 used to supply various operating instructions to the communication system controller 350 is constituted by a switch, a dial, a touch panel, a pointing device based on line of sight or a voice recognition device, or a combination of these components. The operation unit 362 can be used to power on/off the portable terminal 300, to initiate (off-hook) or halt (on-hook) voice communication, to enter a telephone number, to search for a telephone number, and to change a communication mode.

[0059]

In a case that a telephone call has been arrived from another portable terminal and a communication base station, the call arrival notification unit 364 notifies the user of the portable terminal 300 of call arrival by means of a sound such as a calling sound, a voice, music or the

like, and/or an image such as an icon, a dynamic image, a still image, light emission or the like, and/or a vibration. The recording medium attaching/detaching detection unit 366 detects to see whether the recording medium 200 is mounted on the connector 392 or not.

[0060]

The power source control unit 380 is constituted by a battery detection circuit, a DC-DC converter, a switch circuit for switching a block which is to be made electrically conductive and the like, detects mounting/dismounting of a battery, the kind of the battery used and the residue of the battery, controls the DC-DC converter based on a result of this detection and instructions from the communication system control circuit 350, and supplies required voltage to respective components including the recording medium for a required period of time.

[0061]

The power source unit 386 is constituted by a primary battery such as an alkali battery, a lithium battery or the like, a secondary battery such as an NiCd battery, an NiMH battery, an Li-ion battery or the like, an adapter or the like. The interface 390 takes charge of interface with a recording medium such as a memory card, a hard disk or the like. The

connector 392 takes charge of connection with the recording medium such as the memory card, the hard disk or the like.

[0062]

In this connection, although, in this embodiment, a case that one system of the interface and connector to which the recording medium is attached has been described, there may be provided a plurality of systems of the interfaces and connectors to which the recording media are attached. In addition, an interface and a connector which are different from each other in standard may be combined with each other. Further, interfaces and connectors conforming to the standards such as the PCMCIA (Personal Computer Memory Card International Association) card, the CF (Compact Flash) card, the MMC (Multi Media Card) and the like may be used.

[0063]

In a case that as the interface 390 and the connector 392, the interface and the connector conforming to the standards such as the PCMCIA card, the CF card and the like are used, it becomes possible to mutually transfer image data and management information belonging to the image data to/from a peripheral appliance such as another computer, a printer or the like by connecting thereto various communication cards such as the LAN card, the

modem card, the USB card, the IEEE (Institute of Electrical and Electronic Engineers) 1394 card, the P1284 card, the SCSI (Small Computer System Interface) card, the PHS and the like.

[0064]

The recording medium is constituted by a memory card, a hard disk or the like and comprises a recording unit 202 constituted by a semiconductor memory, a magnetic disk or the like, an interface 204 for interface with the portable terminal 300, a connector 206 for connection with the portable terminal 300, and an identification information unit 208.

[0065]

Accordingly, while the system is active and functioning, the image device 100 obtains through the image lens 10 image data that it stores on the recording medium 120 and transmits, via the communication unit 110 and the antenna 112, to the portable terminal 300. And the portable terminal 300 uses the display unit 324 to display the image data as they are received, via the antenna 332 and the communication unit 330, and records them in the memory 326. Concurrently, via the communication unit 326 and the antenna 328, the portable terminal 300 transmits the image data to the portable terminal 700, which is connected to the public communication

network 800 and thence to the image device 500, which is connected to the portable terminal 700.

[0066]

The operation of an image transfer system having the above configuration will now be described.

Figs. 5 and 6 are flowcharts showing the image transfer processing performed by the portable terminal (image display device) 300. The program for performing this processing is stored in the memory 352, and is executed by a CPU (not shown) in the communication system controller 350.

[0067]

First, when the power source of the portable terminal 300 is turned on (step S501), the communication unit 330 is controlled and initiates local wireless communication, such as Bluetooth, between the portable terminal 300 and the image device 100 (step S502). Then, the communication unit 330 outputs an inquiry to determine whether there is an image device 100 on the periphery that can communicate with the portable terminal 300 (step S503).

[0068]

The communication unit 330 examines the results obtained by the inquiry (step S504). If the results are not "OK", the processing is terminated. When the result, however is "OK", and one or more available

communication image devices 100 are found, a pertinent image device 100 is searched for (step S505). This search is performed by matching and comparing the addresses of the image devices stored in the memory 352 with the address of one or more available communication image devices 100. Either this process is used or a search is performed by displaying a list of available image devices 100 on the display unit 360 for the selection by a user of an appropriate one.

[0069]

Then, a check is performed to determine whether a suitable image device 100 has been found that can be used to communicate with the portable terminal 300 (step S506). When no suitable image device is found, the processing is terminated. When, however, a suitable image device 100 is found, the communication unit 330 is employed to establish a connection with the selected image device 100 using a local wireless communication system, such as Bluetooth, and an image list information request is transmitted to obtain information for one or more of the multiple images that are stored in the memory 30 of the image device 100 (step S507).

[0070]

A check is then performed to determine whether image list information has been received in response

to the image list information request (step S508). When no image list information has been received, the processing is terminated. When, however, the communication unit 330 has received image list information, the portable terminal 300 employs that information to obtain a count of the images stored in the memory 30 of the image device 100 and the number of available image information sets (step S509).

Image list information includes the image file names and their sizes stored in the memory 30 of the image device 100, and the number of images stored in the memory 30 of the image device 100 can be obtained by counting the number of image files, for example.

[0071]

When, as a count result, it is found that only one image is stored in the image device 100, the image size (pixel count) of the image list information and the display resolution (pixel count) of the image display unit 324 are employed to determine whether the image can be displayed on the image display unit 324 of the portable terminal 300 (step S526), in order to display only one image on the image display unit 324 of the portable terminal 300. When the image display is not available, program control is shifted to step S510, but when on is available, the communication unit 330 transmits an image request to the image device 100 (step S517).

[0072]

When, at step S509, the image count is equal to or less than the image display capacity of the portable terminal 300, or when an image display is not available at step S526, the communication unit 330 transmits a thumbnail image request to the image device 100 (step S510). In one mode, multiple thumbnail image requests are issued for the individual stored images, and in another mode, a single thumbnail image request is issued for all the images stored in the memory 30.

[0073]

A check is performed to determine whether the thumbnail image can be received from the image device 100 (step S512). When the thumbnail image can not be received, the processing is terminated, but when the communication unit 330 can receive the thumbnail image, a plurality of thumbnail images are displayed on the image display unit 324 (step S514), and a user is permitted to select one of them. Subsequently, a check is performed to determine whether the user has selected an image (step S516), and when the user has selected an image using the operation unit 326, a request for the selected image is transmitted by the communication unit 330 to the image device 100 (step S517).

[0074]

When, as a result of the count performed at step S509, a plurality of images are stored in the image device 100, and when the total size of the stored thumbnail images exceeds the image resolution of the image display unit 324, the image file name obtained from the image list information is displayed as a character, or a new image file name request is transmitted to the image device 100 (step S511). Here, a case that the image file name is freshly requested will be described. In this image file name request, multiple image file name requests are transmitted for the individual stored images, or a single image file name request is issued for all the images stored in the memory 30.

[0075]

A check is performed to determine whether the image file name can be received from the image device 100 (step S513). When the image file name can not be received, the processing is terminated, but when the communication unit 330 can receive the image file name, multiple image files are displayed on the image display unit 324 and the user is permitted to select one of them (step S515). A check is then performed to determine whether the user has selected an image (step S516A), and when one has been selected using the operation unit 362, the communication unit 330 transmits an image request to the image device

100 (step S517). On the other hand, when the user does not select any image, the flow returns to the process at the step S515 to wait until the user selects an image.

[0076]

At step S517, not only an image, but also image data, such as that contained in the image information format shown in Fig. 8, may be requested.

Fig. 8 is a diagram showing the image information format used for the image device 100. The image data shown includes a file name, a shooting date, the model name of the image device that was used and image data. Further, when an image device can automatically identify a shooting location based on GPS (Global Positioning System) positioning information or when positioning information can be acquired by referring to the position of a base station constituting the wireless communication source for a public network, when position information can be input by using the operation unit, or when the shooting location can be input as the keyword for an obtained image, these data may be included in the image information.

[0077]

The portable terminal 300 determines whether an image corresponding to the request (or the image and image information when such information is included)

has been received (step S518). When the communication unit 330 receives an image, this image (or the image and the image information when it is included) is displayed on the image display unit 324 and is stored in the memory 320 (step S519).

[0078]

When the display and storage processes are completed for the portable terminal 300, the local wireless communication performed by the communication unit 330 is halted (step S520). In this case, in order to save battery power the portable terminal 300 halts the local wireless communication; however, when AC power is employed, the local wireless communication may not be halted and the connection state may be constantly maintained.

[0079]

Further, an application for a connection to the public network is activated (step S521), and when the operation is performed by the manipulation of the operation unit 362 of the portable terminal 300 in accordance with an instruction issued by the application, the communication unit 326 is used to establish a dial-up access connection with the destination along the public network, and a response from the recipient destination is waited for. When a response is transmitted by the recipient to the communication unit 326, the communication unit 326

initiates the connection process (step S522).

[0080]

Then, when the connection process has been completed, the image and the image information stored in the memory 320 are transmitted by the communication unit 326 to the public network (step S523). Thereafter, the communication unit 326 waits for the transmission of a transmission OK response by the connection destination (step S524). When the transmission OK response is received by the communication unit 326, the communication unit 326 is disconnected from the public network (step S525) and the processing is thereafter terminated.

[0081]

Fig. 7 is a flowchart showing the image transfer processing performed by the image device 100 when a program stored in the memory 52 is read and executed by the CPU (not shown) in the system controller 50.

[0082]

Here, a case that the primary battery such as the alkali battery, the lithium battery or the like or the secondary battery such as the NiCd battery, the NiMH battery, the Li-ion battery or the like is used as the power source 86 of the image device 100, instead of the adapter will be described.

[0083]

First, when the power source 86 of the image device 100 is turned on (step S601), it is discriminated whether the residue of the battery in the image device 100 is enough or not (step S602). When the residue of the battery is enough, the following processes are executed.

[0084]

That is, the image device 100 waits for an inquiry requesting a search for a peripheral portable terminal 300 that it can communicate with (step S603). The image device 100 determines whether an inquiry request has been received in the request waiting state (step S604), and when no inquiry request has been received, program control returns to step S603.

[0085]

When in this case, however, the communication unit 110 has received an inquiry request, a local wireless communication system, such as Bluetooth, is activated to establish communication between the portable terminal 300 and the image device 100 (step S605), and the communication unit 110 transmits the results obtained for the inquiry to the portable terminal 300 (step S606).

[0086]

It is checked to see whether a connection with the portable terminal 300 has been established (step S607), and when no connection has been established,

program control returns to step S603. However, if the communication unit 110 has established a connection and communication with the portable terminal 300 is available, the image device 100 is set to a state wherein an image list information request from the portable terminal 300 is waited for (step S608). This state is maintained until an image list information request is received (step S609).

[0087]

When the communication unit 110 receives an image list information request, one or all of the image list information sets stored in the memory 30, e.g., image list information having the format shown in Fig. 8, are transmitted by the communication unit 110 to the portable terminal 300 (step S610).

[0088]

Following this, the image device 100 is set to a state wherein it waits to receive an image request from the portable terminal 300 (step S611), and is maintained in this state until an image request is received (step S612). Then, when the communication unit 110 receives an image request, the request type is determined (step S615), and when it is an image request, the image stored in the memory 30 is transmitted by the communication unit 110 (step S616).

[0089]

If a thumbnail image request type is received,

the thumbnail image stored in the memory 30 is transmitted by the communication unit 110 (step S617), and thereafter, program control is returned to step S612 where another image request is waited for. At this time, if at step S615 the request is an image file name type, at step S617, instead of a thumbnail image, or together with a thumbnail image, image information (see Fig. 8) in which the image file name is included is transmitted to the portable terminal 300.

[0090]

A check is then performed to determine whether the transmission of the requested image has been completed (step S618). When the image transmission has been completed, the communication unit 110 halts the local wireless communication process (step S619) and the processing is thereafter terminated. On the other hand, when the image transmission is not terminated at the step S618, the flow returns to the process at the step S611.

[0091]

On the other hand, when the residue of the battery is not enough as a result of discrimination at the step S602, a warning indicative of this fact is displayed on the display unit (step S613) and the power source 86 is turned off (step S614) to terminate this process.

[0092]

According to this embodiment, the operability of the portable terminal 300 can be improved and the image of the image device 100 can be readily selected simply by operating the portable terminal 300. In addition, image transfer using the connection on the public line can be realized with no need to mount the communication protocol such as the PPP or the TCP/IP on the image device 100.

[0093]

One embodiment of the present invention has been explained. However, the present invention is not limited to this embodiment, and can be applied for any configuration so long as the functions cited in the claims of the invention or the functions described in the embodiment explanation are implemented.

[0094]

In the preceding embodiment the portable terminal 300 counts the number of images based on image list information received from the image device 100, and transmits the type of a image requested to the image device 100. Alternatively, from the inquiry request, the image device 100 may obtain the display resolution of the image display unit 324 of the portable terminal 300, and determine which type of image is to be transmitted to the portable

terminal 300 by comparing the pixel count stored in the memory 30 with the display resolution (pixel count) for the image display unit 324 of the portable terminal 300. That is, the processes at the steps S509 to S517 and the step S526 in Fig. 5 may be executed as processes to be executed within the image device 100.

[0095]

In the previous embodiment, the image device 100 transmitted all the requested images to the portable terminal 300. However, when multiple images are present in the memory 30 of the image device 100, thumbnail images for these images may be created by the image device 100, and transmitted by the communication unit 110 to the portable terminal 300, by adding file names (file numbers provided when images having a reduced size are created, or file names provided for image information corresponding to the reduced images) to the thumbnail images. In the portable terminal 300, the communication unit 330 may receive these thumbnail images and display then as a list on the display unit 324.

When a user reads the list and selects one or more thumbnail images, the communication unit 330 may transmit the file names of the selected thumbnail images to the image device 100. Thereafter, the communication unit 110 in the image device 100 may

transmit to the portable terminal 300 information for the original sized images that corresponds to the file names for the thumbnail images received by the communication unit 110. At this time, if only one image is stored in the memory 30, image information for the original size may be transmitted instead of a thumbnail image.

[0096]

Further, the present invention can be applied for a mode wherein a program is supplied to an apparatus by using a storage medium whereon program code for software that implements the functions of the embodiments is stored. In this mode, the program code read from the storage medium can carry out the functions of the invention, and the program and the storage medium on which the program is stored constitute the present invention.

[0097]

In the embodiments, the program code shown in the flowcharts in Figs. 5 to 7 is stored in the ROM that constitutes a storage medium. The storage medium for supplying the program code can be not only a ROM, but also, for example, a floppy disk, a DVD or a nonvolatile memory card.

[0098]

[Effect of the Invention]

According to the present invention, the

operability in image selecting operation of the portable terminal can be improved. As a result, it becomes possible to readily select the image of the image device simply by the operation of the portable terminal. In addition, the image transfer using the connection on the public line can be realized with no need to mount the communication protocol such as the PPP or the TCP/IP on the image device.

[Brief Description Of The Drawings]

[Figure 1]

A diagram showing the general configuration of an image transfer system according to one embodiment of the present invention.

[Figure 2]

A diagram showing the external arrangement of an image device 100 and a portable terminal 300.

[Figure 3]

A block diagram showing the internal electric arrangement of the image device 100.

[Figure 4]

A block diagram showing the internal electric arrangement of the portable terminal 300.

[Figure 5]

A flowchart showing the image transfer processing performed by the portable terminal 300.

[Figure 6]

A flowchart showing the image transfer

processing performed by the portable terminal 300 in Fig. 5.

[Figure 7]

A flowchart showing the image transfer processing performed by the image device 100.

[Figure 8]

A diagram showing the format of image data for the image device 100.

[Description of Reference Numerals or Symbols]

50: system control circuit

110, 326, 330: communication unit

100, 500: image device

300, 700: portable terminal

350: communication system control circuit

800: public communication network

[Name of the Document] Abstract

[Abstract]

[Subject]

A subject of the present invention is to provide an image transfer system making it possible to improve the operability in image selection of a portable terminal.

[Solving Means]

A portable terminal 300 requests to make an inquiry of an image device 100 which is present in a communicable range, establishes connection with the image device 100 of which the inquiry has been successfully made and requests the image device for image list information. Then, the portable terminal determines the type of data to be received based on the image list information received from the image device 100 and requests for the data of the type thus determined. When a user selects an image based on the data transmitted from the image device 100, the portable terminal 300 requests the image device 100 for the image thus selected. In response to this request, the image received from the image device 100 is transmitted onto a public network 800.

[Elected Drawing]

Figure 5